

TEST REPORT

Test report no.: 1-9318-25-02-05_TR1-R02



Deutsche
Akkreditierungsstelle
D-PL-12047-01-00

Testing laboratory

cetecom advanced GmbH

Untertuerkheimer Strasse 6 – 10

66117 Saarbruecken / Germany

Phone: + 49 681 5 98 - 0

Fax: + 49 681 5 98 - 9075

Internet: <https://cetecomadvanced.com>

e-mail: mail@cetecomadvanced.com

Accredited Testing Laboratory:

The testing laboratory (area of testing) is accredited according to DIN EN ISO/IEC 17025 (2018-03) by the Deutsche Akkreditierungsstelle GmbH (DAkkS).

The accreditation is valid for the scope of testing procedures as stated in the accreditation certificate with the registration number:

D-PL-12047-01-00.

ISED Testing Laboratory Recognized Listing Number: DE0001

FCC designation number: DE0002

Applicant

Panasonic Industrial Devices Europe GmbH

Zeppelinstrasse 19

21337 Lüneburg / GERMANY

Phone: +49-4131-899-0

Contact: Marcus Nottorf

e-mail: marcus.nottorf@eu.panasonic.com

Manufacturer

Panasonic Industrial Devices Europe GmbH

Zeppelinstrasse 19

21337 Lüneburg / GERMANY

Test standard/s

FCC 47 CFR Part 15

FCC - Title 47 of the Code of Federal Regulations; Chapter I; Part 15 – Radio frequency devices

RSS-247:Issue 4 (2025-07)

RSS-247 – Digital Transmission Systems, Frequency Hopping Systems and Licence-Exempt Local Area Network Devices in 902-928 MHz, 2400-2483.5 MHz, 5150-5350 MHz, and 5470-5895 MHz bands

For further applied test standards please refer to section 3 of this test report.

Test Item

Kind of test item: WiFi / BLE Module

Model name: PAN W602-2C
PAN W602-2B

FCC ID: T7V-W602

ISED certification number: 216Q-W602

Frequency: UNII bands: 5150 MHz to 5250 MHz; 5250 MHz to 5350 MHz; 5470 MHz to 5725 MHz; 5725 MHz to 5850 MHz

Technology tested: WLAN

Antenna: Integrated chip antenna

Power supply: 3.3 V DC by PCB

Temperature range: -40°C to +85°C

This test report is electronically signed and valid without handwritten signature. For verification of the electronic signatures, the public keys can be requested at the testing laboratory.

Test report authorized:

cn=Marco Bertolino, o=cetecom advanced GmbH, ou=BTL-251205, email=Marco.Bertolino@cetecomadvanced.com, c=DE
2026.06.30 13:52:04 +02'00'

Marco Bertolino
Supervisor Radio Lab
Regulatory Services Radio

Test performed:

cn=David Lang, o=cetecom advanced GmbH, ou=LNG-230530, email=david.lang@cetecomadvanced.com, c=DE
2026.06.30 13:36:10 +02'00'

David Lang
Coordinator Area
Regulatory Services Radio

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2 General information

2.1 Notes and disclaimer

The test results of this test report relate exclusively to the test item specified in this test report. cetecom advanced GmbH does not assume responsibility for any conclusions and generalizations drawn from the test results with regard to other specimens or samples of the type of the equipment represented by the test item.

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This test report replaces the test report with the number 1-9318-25-02-05_TR1-R01 and dated 2026-06-29.

2.2 Application details

Date of receipt of order:	2026-05-11
Date of receipt of test item:	2026-05-28
Start of test:*	2026-05-28
End of test:*	2026-06-23
Person(s) present during the test:	-/-

*Date of each measurement, if not shown in the plot, can be requested. Dates are stored in the measurement software.

2.3 Test laboratories sub-contracted

None

3 Test standard/s, references and accreditations

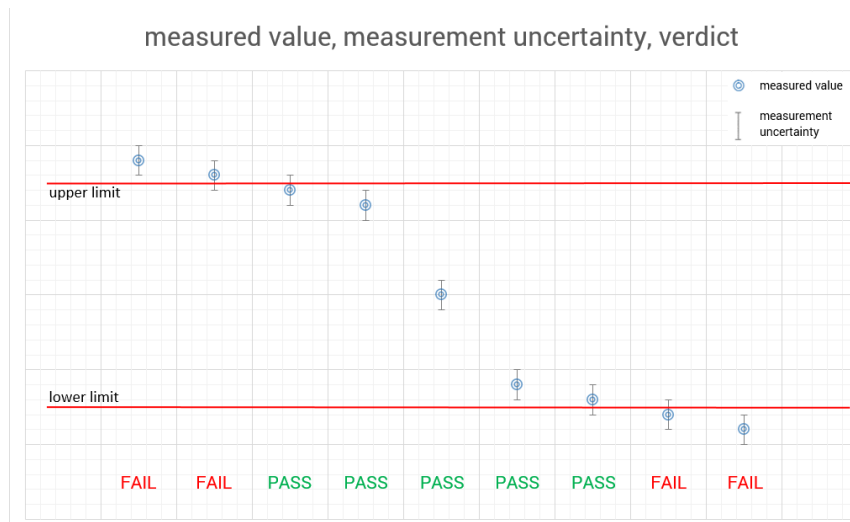
Test standard	Date	Description
FCC 47 CFR Part 15	-/-	FCC - Title 47 of the Code of Federal Regulations; Chapter I; Part 15 – Radio frequency devices
RSS-247:Issue 4 (2025-07)	2025-07-24	RSS-247 – Digital Transmission Systems, Frequency Hopping Systems and Licence-Exempt Local Area Network Devices in 902-928 MHz, 2400-2483.5 MHz, 5150-5350 MHz, and 5470-5895 MHz bands
RSS-Gen:Issue 5 (2018-04) + Amendment 1 (2019-03) + Amendment 2 (2021-02)	2021-02-01	General Requirements for Compliance of Radio Apparatus

Guidance	Version	Description
KDB 789033 D02	v02r01	Guidelines for Compliance Testing of Unlicensed National Information Infrastructure (U-NII) Devices - Part 15, Subpart E
ANSI C63.10-2020	-/-	American National Standard of Procedures for Compliance Testing of Unlicensed Wireless Devices
ANSI/USEMCSC C63.10a-2024 Amendment 1	2024-08-08	American National Standard of Procedures for Compliance Testing of Unlicensed Wireless Devices Amendment 1
ANSI/USEMCSC C63.10a-2024 Amendment 1 Errata	2024-11-18	Errata to American National Standard for Procedures for Compliance Testing of Unlicensed Wireless Devices Amendment 1 Correction Sheet
UNII: KDB 905462 D02	v02	Compliance measurement procedures for unlicensed - national information infrastructure devices operating in the 5250 - 5350 MHz and 5470 - 5725 MHz bands incorporating dynamic frequency selection
UNII: KDB 905462 D03	v01r02	Client Without DFS New Rules
UNII: KDB 905462 D04	v01	Operational Modes for DFS Testing New Rules

4 Reporting statements of conformity – decision rule

Only the measured values related to their corresponding limits will be used to decide whether the equipment under test meets the requirements of the test standards listed in chapter 3.

The measurement uncertainty is mentioned in this test report, see chapter 7, but is not taken into account - neither to the limits nor to the measurement results. Measurement results with a smaller margin to the corresponding limits than the measurement uncertainty have a potential risk of more than 5% that the decision might be wrong."



5 Test environment

Temperature	:	T_{nom} T_{max} T_{min}	+20 °C during room temperature tests +85 °C during high temperature tests -40 °C during low temperature tests
Relative humidity content	:		55 %
Barometric pressure	:		1021 hpa
Power supply	:	V_{nom} V_{max} V_{min}	3.3 V DC by PCB -/- -/-

6 Test item

6.1 General description

Kind of test item	:	WiFi / BLE Module
Model name	:	PAN W602-2C PAN W602-2B Note: The PAN W602-2B variant with U.FL connector has been used for conducted measurements while the W602-2C variant with chip antenna has been used for radiated measurements.
HMN	:	N/A
PMN	:	PAN W602-2C PAN W602-2B
HVIN	:	ENWF9215A ENWF9215C
FVIN	:	N/A
S/N serial number	:	Board 6
Hardware status	:	03
Software status	:	01
Firmware status	:	TBD
Frequency band	:	UNII bands: 5150 MHz to 5250 MHz; 5250 MHz to 5350 MHz; 5470 MHz to 5725 MHz; 5725 MHz to 5850 MHz
Type of radio transmission	:	OFDM, OFDMA
Use of frequency spectrum	:	
Type of modulation	:	(D)BPSK, (D)QPSK, 16 – QAM, 64 – QAM
Number of channels	:	24 with 20 MHz channel bandwidth
Antenna	:	Integrated chip antenna; 2.1 dBi as declared by the manufacturer
Power supply	:	3.3 V DC by PCB
Temperature range	:	-40°C to +85°C

6.2 Additional information

The content of the following annexes is defined in the QA. It may be that not all of the listed annexes are necessary for this report, thus some values in between may be missing.

Test setup and EUT photos are included in test report:

1-9318-25-02-01_TR1-A101-R01
1-9318-25-02-01_TR1-A102-R01
1-9318-25-02-01_TR1-A104-R01

7 Measurement uncertainty

Measurement uncertainty	
Test case	Uncertainty
Frequency accuracy (radar burst)	0.2 Hz
Level accuracy (radar burst)	± 1.83 dB

8 Summary of measurement results

☒	No deviations from the technical specifications were ascertained
☐	There were deviations from the technical specifications ascertained
☒	This test report is only a partial test report. The content and verdict of the performed test cases are listed below.

TC Identifier	Description	Verdict	Date	Remark
DFS-Testing	CFR Part 15, FCC 06-96	Passed	2026-06-30	DFS only

Test Standard Clause	Test Case	Bandwidth	C	NC	NA	NP	Remark
7.8.1*3	U-NII Detection Bandwidth	-/-	☐	☐	☒	☐	*1*2*3
§15.407 (h)(2)	DFS Detection Threshold	-/-	☐	☐	☒	☐	*1*2*3
§15.407 (h)(2) (ii) & 7.8.2*3	Channel Availability Check Time	-/-	☐	☐	☒	☐	*1*3
§15.407 (h)(2) (iv) & 7.8.3*3	Non-Occupancy Period	20 MHz	☒	☐	☐	☐	*2
§15.407 (h)(2) (iii) & 7.8.2*3	Channel Move Time / Channel Closing Transmission Time	20 MHz	☒	☐	☐	☐	*2
7.8.3 & 7.8.4*3	In-Service Monitoring / Statistical Performance Check	-/-	☐	☐	☒	☐	*2*3

Abbreviations/References:

- C Compliant
- NC Not compliant
- NA Not applicable
- NP Not performed
- *1 Prior to use of a channel
- *2 During normal operation
- *3 Not applicable for Client Devices without radar detection.

9 Additional comments

- Reference documents: Main report: 1-9318-25-02-04 issued by cetecom advanced GmbH
Customer_Questionnaire_1-9318-25-01.docx
rf_ant_ant162442dt-2001a2_summary_en.pdf
- Special test descriptions: A sample with temporary antenna connector was provided to perform the measurements in a conducted way.
Test port connectors have been considered with 0.5dB attenuation.
- Configuration descriptions: Iperf was used to generate the required channel load (duty cycle greater 17 percent).
- DFS functionality: ☐ Master device
☐ Client with radar detection
☒ Client without radar detection
- EUT selection: ☐ Only one device available
☐ Devices selected by the customer
☒ Devices selected by the laboratory (Randomly)

10 RF measurements

10.1 Description of test setup

10.1.1 Conducted measurements

Setup

Figure 1 shows a setup whereby the UUT is a RLAN device operating in slave mode, without Radar Interference Detection function. This setup also contains a RLAN device operating in master mode. The radar test signals are injected into the master device. The UUT (slave device) is associated with the master device.

Figure 1 shows an example

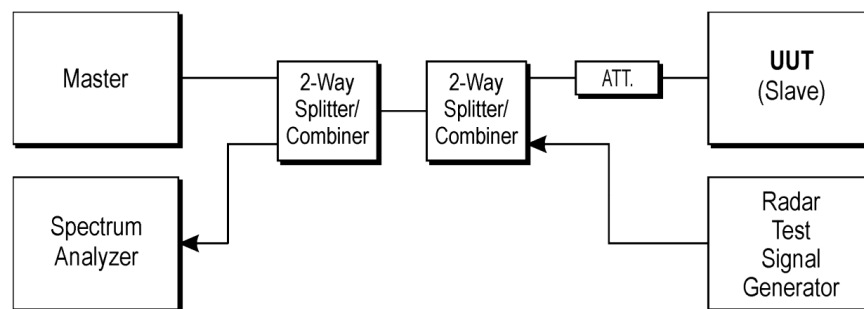


Figure 1: Setup

RPP = SG - CA

(RPP-radar pulse power; SG-signal generator power; CA-loss signal path)

Example calculation:

RPP [dBm] = -30.0 [dBm] - 33.0 [dB] = -63.0 [dBm]

Equipment table:

No.	Setup	Equipment	Type	Manufacturer	Serial No.	INV. No.	Kind of Calibration	Last Calibration	Next Calibration
11	A	Vector Signal Generator	Vector Signal Generator SMU200A	Rohde & Schwarz Messgerätebau GmbH Memmingen	101633	40164	cal	11.03.2025	31.03.2028
2	A	Spectrum Analyzer 9kHz to 30GHz - 140...+30dBm	Spectrum Analyzer 9kHz to 30GHz - 140...+30dBm FSP30	Rohde & Schwarz Messgerätebau GmbH Memmingen	100886	40185	cal	03.12.2024	31.12.2026
3	A	DFS-test site	DFS-test site div. Splitter, Cables, Attenuators	Mini-Circuits Brooklyn	na	40186	cpu	-/-	-/-
4	A	Notebook	Notebook Latitude 15 6000 Series	Dell GmbH Frankfurt		40187	cnn	-/-	-/-
5	A	PC	PC ExOne	MEC Import: F+W	2890296v001	40190	cnn	-/-	-/-
6	A	RF-Cable DFS-Tester Receiver	RF-Cable DFS-Tester Receiver ST18/SMAM/SMAM /24	Huber & Suhner GmbH Taufkirchen	Batch no. 1308650	40191	cpu	-/-	-/-
7	A	RF-Cable DFS-Tester SMU	RF-Cable DFS-Tester SMU 1520.9927.00	MEC Import:		40192	cpu	-/-	-/-
8	A	RF-Cable DFS-Tester No. 1	RF-Cable DFS-Tester No. 1 Enviroflex 316 D	Huber & Suhner GmbH Taufkirchen	Batch no. 1560522	40193	cpu	-/-	-/-
9	A	RF-Cable DFS-Tester No. 6	RF-Cable DFS-Tester No. 6 Enviroflex 316 D	Huber & Suhner GmbH Taufkirchen	Batch no. 1560522	40198	cpu	-/-	-/-
10	A*	GL iNet Wi-Fi 7 Router	GL iNet Wi-Fi 7 Router		12e87cb5c19d34ff	41052	cnn	-/-	-/-

* FCC ID: 2AFIW-BE9300

10.2 Parameters of DFS test signals

10.2.1 DFS Detection Thresholds for Master Devices as well as Client Devices With Radar Detection

Maximum Transmit Power EIRP	Value (see note)
≥ 200 mW	-64 dBm
< 200 mW and power spectral density < 10 dBm/MHz	-62 dBm
< 200 mW and That do not meet the power spectral density < 10 dBm/MHz	-64 dBm
Note 1: This is the level at the input of the receiver assuming a 0 dBi receive antenna. Note 2: Throughout these test procedures an additional 1 dB has been added to the amplitude of the test transmission waveforms to account for variations in measurement equipment. This will ensure that the test signal is at or above the detection threshold level to trigger a DFS response. Note3: EIRP is based on the highest antenna gain. For MIMO devices refer to KDB Publication 662911 D01.	

10.2.2 DFS Response Requirement Values

Parameter	Value
Non-occupancy period	minimum 30 minutes
Channel Availability Check Time	60 seconds
Channel Move Time	10 seconds See Note 1.
Channel Closing Transmission Time	200 milliseconds + an aggregate of 60 milliseconds over remaining 10 second period. See Notes 1 and 2.
U-NII Detection Bandwidth	Minimum 100% of the U-NII 99% transmission power bandwidth. See Note 3.
Note 1: Channel Move Time and the Channel Closing Transmission Time should be performed with Radar Type 0. The measurement timing begins at the end of the Radar Type 0 burst. Note 2: The Channel Closing Transmission Time is comprised of 200 milliseconds starting at the beginning of the Channel Move Time plus any additional intermittent control signals required to facilitate a Channel move (an aggregate of 60 milliseconds) during the remainder of the 10 second period. The aggregate duration of control signals will not count quiet periods in between transmissions. Note 3: During the U-NII Detection Bandwidth detection test, radar type 0 should be used. For each frequency step the minimum percentage of detection is 90 percent. Measurements are performed with no data traffic.	

10.2.3 Radar Test Waveforms

This section provides the parameters for required test waveforms, minimum percentage of successful detections, and the minimum number of trials that must be used for determining DFS conformance.

Short Pulse Radar Test Waveforms

Radar Type	Pulse Width (μsec)	PRI (μsec)	Number of Pulses	Minimum Percentage of Successful Detection	Minimum Number of Trials
0	1	1428	18	See Note 1	See Note 1
1	1	Test A: 15 unique PRI values randomly selected from the list of 23 PRI values in Table 5a	Roundup $\left\{ \left(\frac{1}{360} \right), \left(\frac{19 \cdot 10^6}{\text{PRI}_{\mu\text{sec}}} \right) \right\}$	60%	30
		Test B: 15 unique PRI values randomly selected within the range of 518-3066 μsec, with a minimum increment of 1 μsec, excluding PRI values selected in Test A			
2	1-5	150-230	23-29	60%	30
3	6-10	200-500	16-18	60%	30
4	11-20	200-500	12-16	60%	30
Aggregate (Radar Types 1-4)				80%	120
Note 1: Short Pulse Radar Type 0 should be used for the detection bandwidth test, channel move time, and channel closing time tests.					

A minimum of 30 unique waveforms are required for each of the Short Pulse Radar Types 2 through 4.

Pulse Repetition Intervals Values for Test A

Pulse Repetition Frequency Number	Pulse Repetition Frequency (Pulses Per Second)	Pulse Repetition Interval (Microseconds)
1	1930.5	518
2	1858.7	538
3	1792.1	558
4	1730.1	578
5	1672.2	598
6	1618.1	618
7	1567.4	638
8	1519.8	658
9	1474.9	678
10	1432.7	698
11	1392.8	718
12	1355	738
13	1319.3	758
14	1285.3	778
15	1253.1	798
16	1222.5	818
17	1193.3	838
18	1165.6	858
19	1139	878
20	1113.6	898
21	1089.3	918
22	1066.1	938
23	326.2	3066

Long Pulse Radar Test Waveform

Radar Type	Pulse Width (µsec)	Chirp Width (MHz)	PRI (µsec)	Number of Pulses per Burst	Number of Bursts	Minimum Percentage of Successful Detection	Minimum Number of Trials
5	50-100	5-20	1000-2000	1-3	8-20	80%	30

The parameters for this waveform are randomly chosen. Thirty unique waveforms are required for the Long Pulse Radar Type waveforms.

Frequency Hopping Radar Test Waveform

Radar Type	Pulse Width (µsec)	Chirp Width (MHz)	Pulses per Hop	Hopping Rate (kHz)	Hopping Sequence Length (msec)	Minimum Percentage of Successful Detection	Minimum Number of Trials
6	1	333	9	0.333	300	70%	30

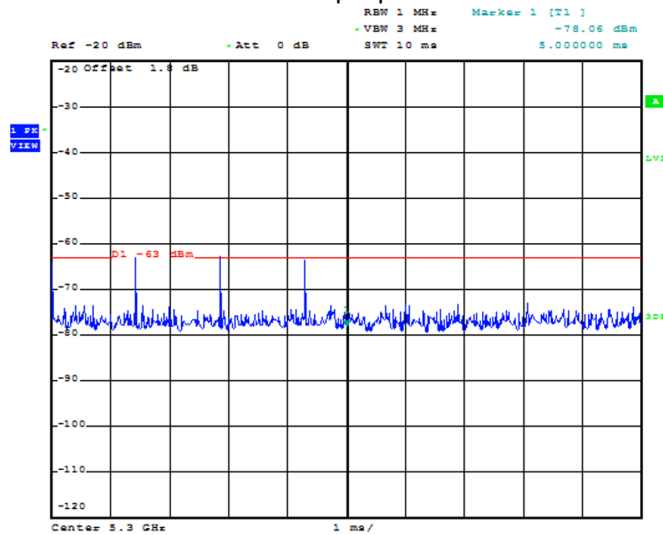
For the Frequency Hopping Radar Type, the same Burst parameters are used for each waveform. The hopping sequence is different for each waveform and a 100-length segment is selected from the hopping sequence defined.

The first frequency in a hopping sequence is selected randomly from the group of 475 integer frequencies from 5250 – 5724 MHz. Next, the frequency that was just chosen is removed from the group and a frequency is randomly selected from the remaining 474 frequencies in the group. This process continues until all 475 frequencies are chosen for the set.

10.3 Test preparation

10.3.1 Setting the test signal level of all radar pulses as of 10.2.1 (only pulse 0 recorded).

Example plot

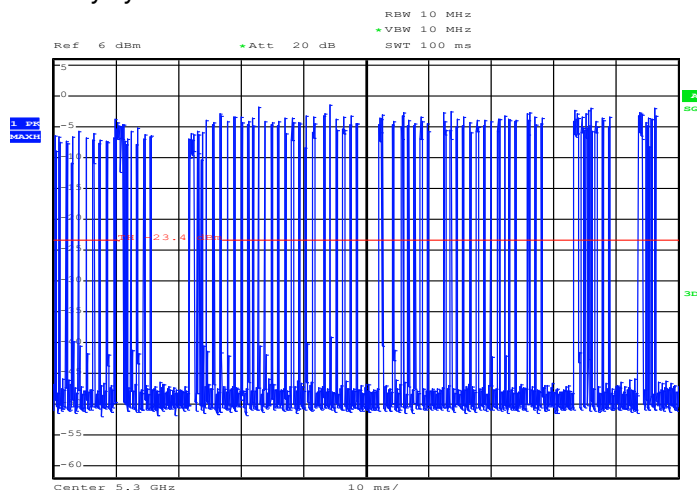


Plot 1

10.3.2 Channel loading

Timing plots are required with calculations demonstrating a minimum channel loading of approximately 17% or greater. For example, channel loading can be estimated by setting the spectrum analyzer for zero span and approximate the Time On/ (Time On + Off Time). This can be done with any appropriate channel BW and modulation type.

20MHz-mode: Calculated duty cycle = 23%

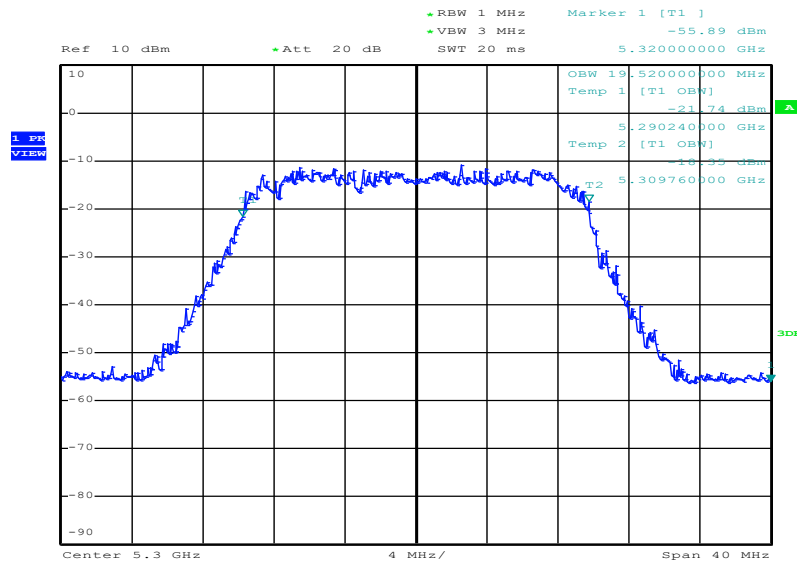


Date: 23.JUN.2026 08:32:57

Plot 2

10.3.3 99% Bandwidth to determine the U-NII-bandwidth

20MHz-mode: 19.5 MHz



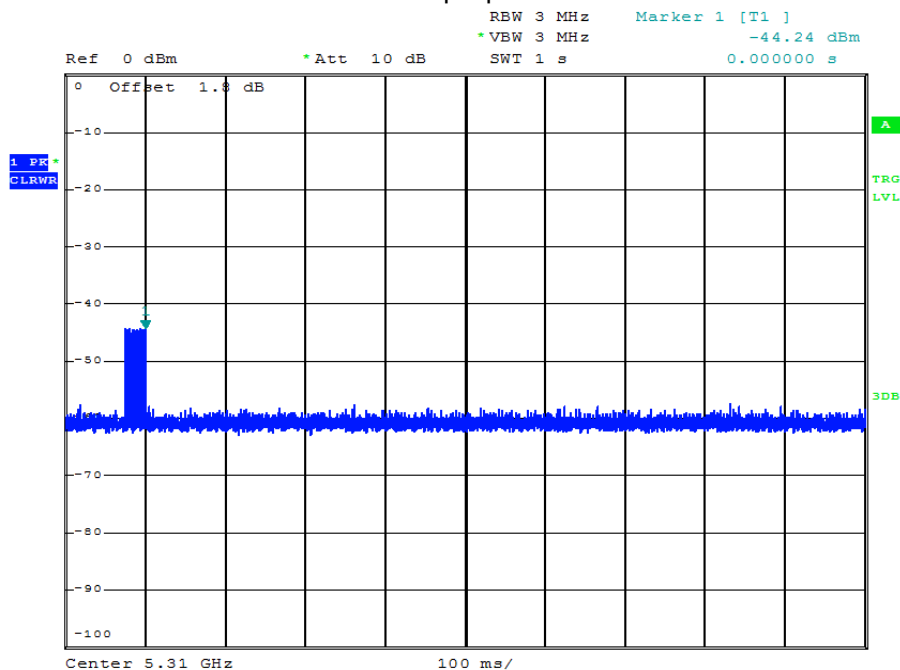
Date: 23.JUN.2026 08:32:09

Plot 3

10.3.4 Radar burst timing signal

To accurately determine the channel closing time and channel closing transmission time the spectrum analyser is triggered at the end of the radar burst (see marker at $t = 0$ ms).

Example plot



Plot 4

10.4 Test results (prior to use of a channel)

Not applicable.

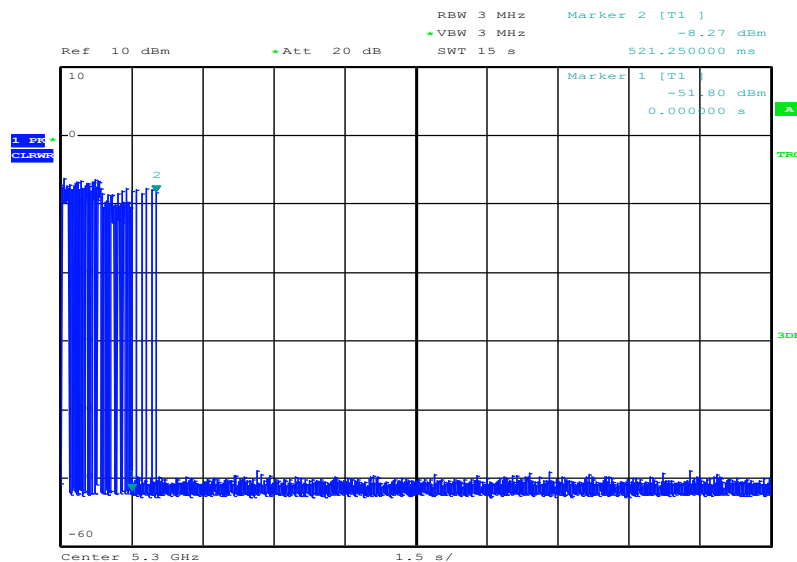
10.5 Test results (during normal operation)

10.5.1 Channel move time / channel closing transmission time

After a radar's presence is detected, all transmissions shall cease on the operating channel within 10 seconds. Transmissions during this period shall consist of normal traffic for a maximum of 200 ms after detection of the radar signal. In addition, intermittent management and control signals can be sent during the remaining time to facilitate vacating the operating channel not exceeding 60ms.

The test is performed during normal operation with the highest bandwidth supported by the DUT.

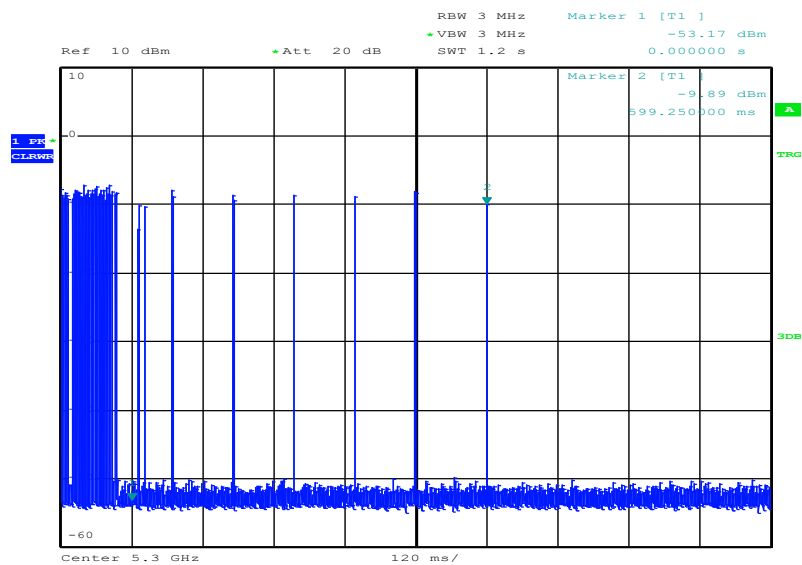
Channel Closing Time



Date: 23.JUN.2026 08:33:42

Plot 5

Note: With Marker 1 at the end of the radar pulse ($t = 0$ ms) the Channel Closing Time is determined by setting a Delta-Marker to the point where the last transmission occurred. The Channel Closing Time is 521.3ms.

Channel Closing Transmission Time

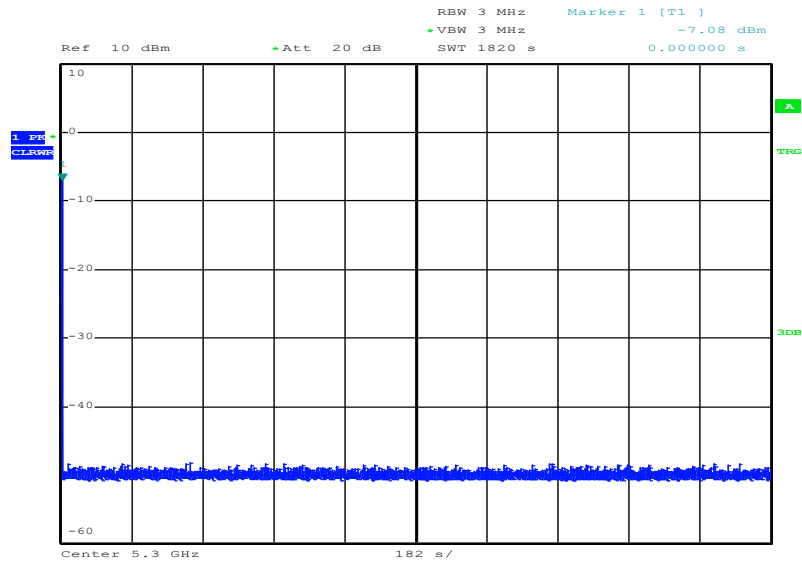
Date: 23.JUN.2026 08:39:18

Plot 6

Note: The accumulated transmission time is calculated by the number of bins occurring after $t = 0$ ms multiplied with the Time-per-sweep point-factor resulting from the Sweep Time and number of Sweep Points of the Spectrum Analyser.
The Channel Closing Transmission Time is 5.3ms.

10.5.2 Non-Occupancy Period

A channel that has been flagged as containing a radar system, either by a channel availability check or in-service monitoring, is subject to a non-occupancy period of at least 30 minutes. The non occupancy period starts at the time when the radar system is detected.



Date: 23.JUN.2026 09:12:38

Plot 7

10.6 Observations

No observations except those reported with the single test cases have been made.

11 Glossary

AVG	Average
C	Compliant
CAC	Channel availability check
CW	Clean wave
DC	Duty cycle
DFS	Dynamic frequency selection
DSSS	Dynamic sequence spread spectrum
DUT	Device under test
EN	European Standard
EMC	Electromagnetic Compatibility
EUT	Equipment under test
FCC	Federal Communications Commission
FCC ID	Combination of Grantee Code and Equipment Product Code
FHSS	Frequency hopping spread spectrum
FVIN	Firmware version identification number
HMN	Host marketing name
HVIN	Hardware version identification number
HW	Hardware
ISED	Innovation, Science and Economic Development Canada
Inv. No.	Inventory number
MC	Modulated carrier
NA	Not applicable
NC	Not compliant
NOP	Non occupancy period
NP	Not performed
OBW	Occupied bandwidth
OC	Operating channel
OCW	Operating channel bandwidth
OFDM	Orthogonal frequency division multiplexing
OOB	Out of band
OP	Occupancy period
PER	Packet error rate
PMN	Product marketing name
PP	Positive peak
QP	Quasi peak
RLAN	Radio local area network
S/N or SN	Serial number
SW	Software
UUT	Unit under test
WLAN	Wireless local area network

12 Document history

Version	Applied changes	Date of release
R01	Initial release	2026-06-29
R02	HVIN revised	2026-06-30

END OF TEST REPORT